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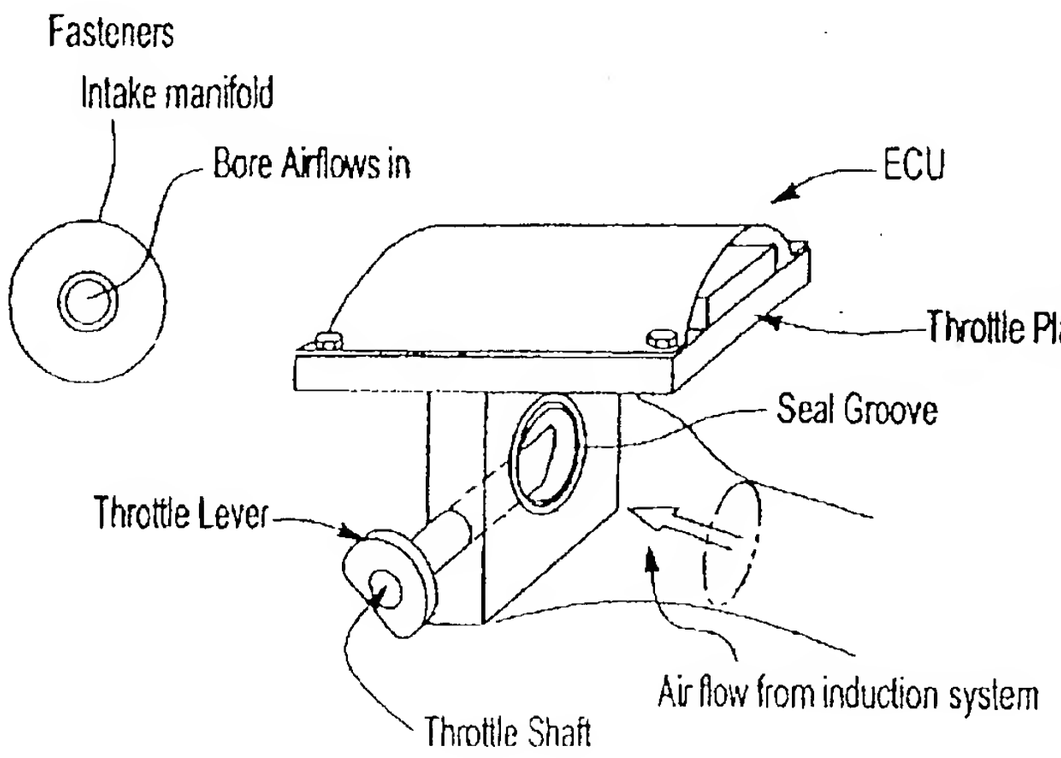
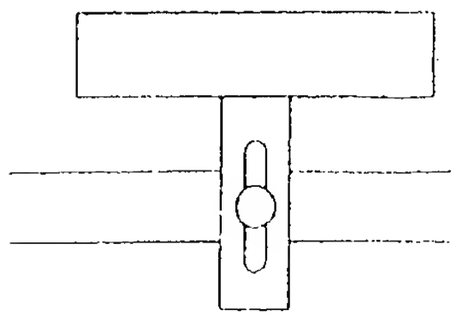
(54) Aluminium throttle body cartridge with engine control module heat sink

(57) The air supply system of the vehicle engine includes a flow body that allows for the flow of air through a flow passage to the vehicle engine. An aluminum support mounts the engine control module. This support is then placed in communication with cool air flowing through the flow passage. Heat is accordingly dissipated from the engine control module. Because of the proximity of the air supply system to the vehicle engine, the wire harness for the engine control module is shortened.





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Description

BACKGROUND OF THE INVENTION

[0001] This invention relates to an air supply system that serves to dissipate heat from an engine control module for a vehicle.

[0002] An air supply system provides clean air to engine cylinders of a vehicle. Such a system includes an intake opening that allows air to flow through a flow passage into a manifold, which then distributes air to the engine cylinders. Typically, a throttle valve controls the flow of air in the flow passage through the opening and closing of a throttle blade.

[0003] An engine control module frequently controls the operation of the throttle valve as well as other components of the vehicle engine. Electronic components on the engine control module are susceptible to overheating. Accordingly, an engine control module is frequently mounted away from the heat of the vehicle engine. The location of the engine control module away from the engine, however, results in a long wire harness.

[0004] A need therefore exists to dissipate heat from the engine control module in closer proximity to the vehicle engine.

SUMMARY OF THE INVENTION

[0005] In a disclosed embodiment of this invention, the air supply system of the vehicle engine includes a flow body that allows for the flow of air through a flow passage to the vehicle engine. An aluminum support mounts the engine control module. This support is then placed in communication with cool air flowing through the flow passage. Heat is accordingly dissipated from the engine control module. Because of the proximity of the air supply system to the vehicle engine, the wire harness for the engine control module is consequently shortened.

[0006] Another embodiment of the invention mounts the engine control module onto a support inserted into the flow passage. This support mounts the throttle valve and related components already in communication with air in the flow passage. Accordingly, the invention takes advantage of existing heat conductive components of the air supply system to dissipate heat from the engine control module. These throttle components include bearings, seals, and a throttle position sensor.

[0007] These and other features of the present invention can be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description of the currently preferred embodiment. The drawings that accompany the detailed description can be briefly described as follows:

Figure 1 shows the present invention in its environment, an engine control module in communication with a flow body, including flow passage, and manifold.

Figure 2 shows a magnified view of the invention of Figure 1, including electronic control module and support.

Figure 3 shows a detailed view of an embodiment of the invention, including electronic control module, support, throttle blade, throttle shaft, bearing bore, and seal.

Figure 4 shows a cross-sectional view of Figure 3, including throttle blade and throttle shaft.

Figure 5 shows an exploded view of the invention Figure 4, including a throttle position sensor.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0009] Figure 1 presents a view of the present invention in its environment. Flow body 20, including flow passage 22, and engine manifold 24 are presented. Support 26 communicates with air flowing through flow passage 22. Engine control module 28 is mounted to support 26, allowing heat from engine control module 28 to dissipate to the air.

[0010] Figure 2 presents a magnified view of the invention of Figure 1. Flow body 20 and flow passage 22 interconnect with support 26, which mounts engine control module 28. In this view, seal 30, throttle shaft 34, and throttle blade 36 are shown. Seal 30 prevents the communication of air to flow passage 22 from the interconnection of support 26 to flow body 20 and flow passage 22. Throttle shaft 34 and throttle blade 36 regulate the flow of air through flow passage and consequently to manifold 24 by rotating to an open or closed position.

[0011] Figure 3 presents a detailed view of an embodiment of the invention. Support 26 is shown with engine control module 28. Engine control module 28 is mounted to support by fasteners placed in holes 40A and 40B. Seal grooves 42 are disposed in support 26 to allow flow body 20 to be sealed against support 26. In addition, bear bore 44 and shaft bore 46 permit the mounting of throttle shaft 34 and bearings 48.

[0012] A cross-sectional view of the embodiment of Figure 3 is shown by Figure 4. Support 26, engine control module 28, throttle shaft 34, throttle blade 36, bearing bore 44 and now bearing bore 50 are illustrated. In addition, the invention provides a mount 52 for a throttle position sensor, shown in Figure 5.

[0013] Figure 5 shows an exploded view of an embodiment of the invention, including throttle position sensor 60. Support 26, engine control module 28, throttle shaft 34, bearings 48 and 62, and throttle blade 36 are shown

disassembled. Also, seal 64 serves to prevent leaking of air through bearing 48. Throttle position sensor 60 is shown in relation to support 26. Throttle position sensor 60 may also be integrated with engine control module 28. Other components of the air supply system may also be integrated to support 26.

[0014] The aforementioned description is exemplary rather then limiting. Many modifications and variations of the present invention are possible in light of the above teachings. The preferred embodiments of this invention have been disclosed. However, one of ordinary skill in the art would recognize that certain modifications would come within the scope of this invention. Hence, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described. For this reason the following claims should be studied to determine the true scope and content of this invention.

Claims

1. An air supply system for a vehicle engine comprising:
   a flow body including a flow passage; and
   an engine control module in communication with said flow passage.

2. A system as set forth in claim 1, including a support for said engine control module in communication with said flow passage.

3. A system as set forth in claim 2, wherein said support is an insert.

4. A system as set forth in claim 3, wherein said insert includes
   a seal to prevent the communication of air to said flow passage.

5. A system as set forth in claim 3, wherein said insert interconnects to a throttle valve.

6. A system as set forth in claim 5, wherein said throttle valve includes a throttle blade and throttle shaft.

7. A system as set forth in claim 6, wherein said throttle shaft interconnects to a bearing.

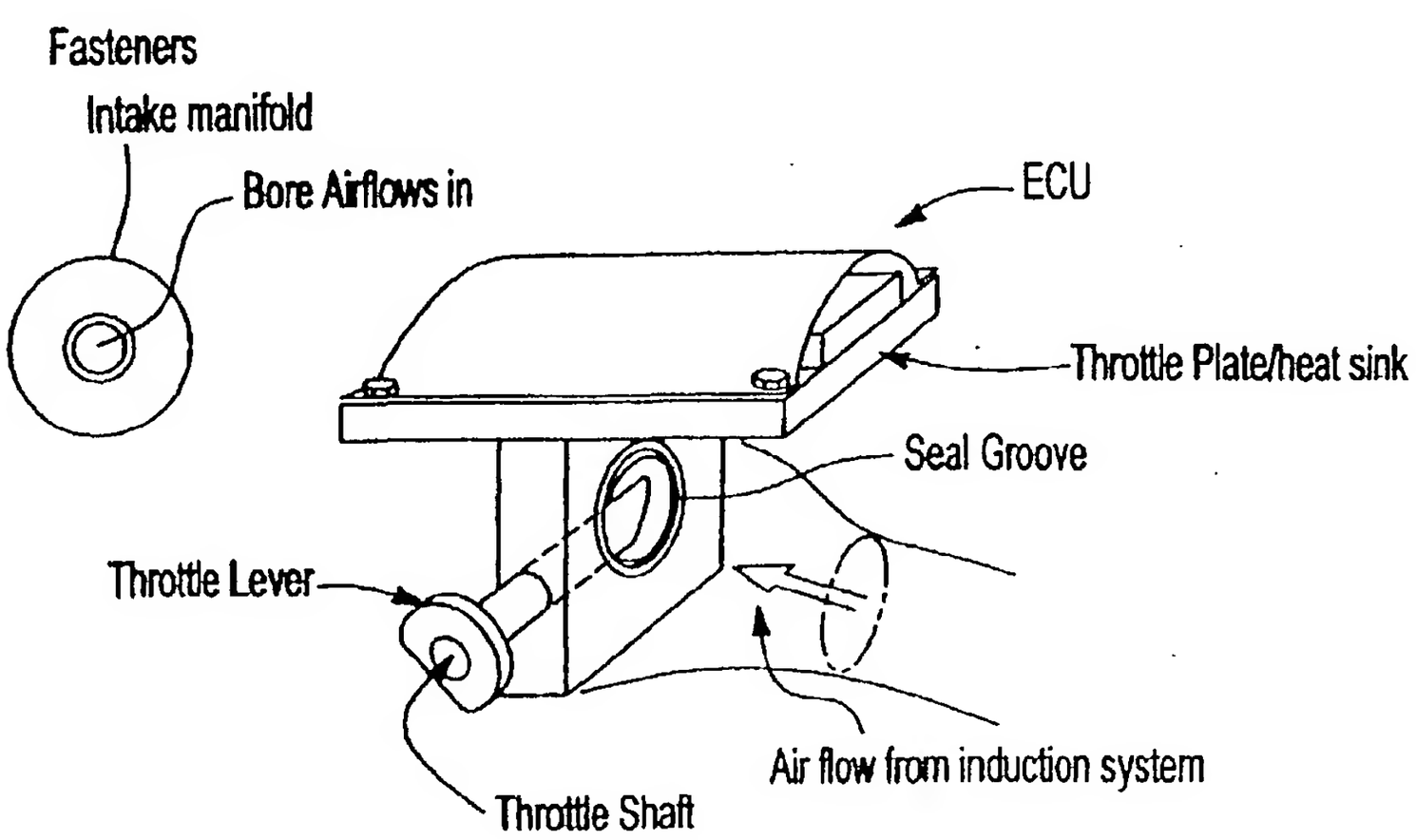
8. A system as set forth in claim 7, wherein said bearing interconnects to said insert.

9. A system as set forth in claim 1, wherein said support is metal.

10. A system as set forth in claim 1, wherein said support is aluminum.

11. A method for dissipating heat away from an engine control module comprising the steps of:
    providing an engine control module for an air supply system for a vehicle;
    placing said engine control module in communication with air from a flow body of said air supply system; and
    conducting heat from said engine control module to air flowing through said flow body.

12. A method for dissipating heat away from an engine control module as set forth in claim 11, wherein a heat sink conducts heat to air flowing through said flow body.


Fasteners
Intake manifold
Bore Airflows in
ECU
Throttle Plate/heat sink
Seal Groove
Throttle Lever
Air flow from induction system
Throttle Shaft